

# **EIGHT MILE PRAIRIE HOMEOWNER'S ASSOCIATION (PWS #1280254) SOURCE WATER ASSESSMENT REPORT**

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**October 17, 2001**



## **State of Idaho Department of Environmental Quality**

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## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for Eight Mile Prairie Homeowner's Association (PWS #1280254)*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Eight Mile Prairie Homeowner's Association drinking water system consists of one well. The well was drilled in 1990 to a depth of 434'. It serves a community of approximately 50 people on the Rathdrum Prairie. The water system has a history of good water quality. However, in May of 2000 a water sample revealed the chemical Di(2-ethylhexyl)phthalate at 3.66µg/L, more than half of the 6.0µg/L maximum contaminant level. A follow-up sample taken in July of that year again revealed Di(2-ethylhexyl)phthalate at 2.7µg/L. A second follow-up sample was taken in August of 2000, this time bypassing the reservoir and distribution system. That sample was negative for Di(2-ethylhexyl)phthalate. The cause of the episode of contamination was never determined. Di(2-ethylhexyl)phthalate is associated with discharge from chemical factories and with rubber hoses. The water system is currently not experiencing any water quality problems.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Eight Mile Prairie Homeowner's Association should focus source water protection activities on implementation of practices aimed at maintaining current water quality. The water system should develop a drinking water protection plan that addresses public education, potential contaminant source management and contingency planning. The system's existing cross connection control program can become an integral part of their new drinking water protection plan. Partnerships with state and local agencies and industry groups should be established and are critical to success.

The large number of public water systems in Idaho drawing water from the Rathdrum Prairie Aquifer should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures.

Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies, please contact your regional Idaho Department of Environmental Quality office or the Idaho Rural Water Association.

## **SOURCE WATER ASSESSMENT FOR EIGHT MILE PRAIRIE HOMEOWNER'S ASSOCIATION**

### **Section 1. Introduction- Basis for Assessment**

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached.

#### **Level of Accuracy and Purpose of the Assessment**

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

## **Section 2. Conducting the Assessment**

### **General Description of the Source Water Quality**

Eight Mile Prairie Homeowner's Association serves a community of approximately 50 people, located between the communities of Rathdrum and Athol on the Rathdrum Prairie (Figure 1). The public drinking water system for Eight Mile Prairie Homeowner's Association is comprised of one well.

Eight Mile Prairie Homeowner's Association is currently not facing water quality problems. The water system samples monthly for total coliform bacteria. The last positive sample was collected 8/28/00. Nitrate levels are measured annually and nitrite is measured every nine years. Both have consistently been well below maximum contaminant levels. Every three years the water system samples for inorganic chemicals. A sample collected on 4/28/94 revealed cadmium at .00035mg/L. The maximum contaminant level for cadmium is .005mg/L. The same sample revealed fluoride at .12mg/L. The maximum contaminant level for fluoride is 4.0mg/L. A sample collected 3/5/98 revealed fluoride at .2mg/L. Lead and copper levels are also monitored every three years and are below action levels. Radiological contaminants are monitored every four years and are within normal limits. The system had obtained waivers for reduced monitoring of volatile organic chemicals and synthetic organic chemicals, but routine monitoring completed on 5/12/00 revealed the chemical Di(2-ethylhexyl)phthalate at 3.66µg/L. A sample collected 7/21/00 revealed the level of Di(2-ethylhexyl)phthalate to be at 2.77µmg/L. A third sample was collected on 8/29/00, this time directly from the well itself. That sample was negative for the presence of Di(2-ethylhexyl)phthalate. The Di(2-ethylhexyl)phthalate contamination is considered to be resolved at this time. No volatile organic chemicals have been detected in the well. Eight Mile Prairie Homeowner's Association does not treat its water as treatment is neither necessary nor required.

### **Defining the Zones of Contribution- Delineation**

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the three-year (Zone 1B), six-year (Zone 2), and ten-year (Zone 3) times-of-travel (TOT) for water associated with the Rathdrum Prairie aquifer in the vicinity Athol, Idaho. The computer model used site specific data, assimilated by DEQ from a variety of sources including the city and other local well logs. The delineated source water assessment area for Eight Mile Prairie Homeowner's Association can best be described as a slight curve beginning south of Brunner Road and extending northwest across Clagstone Road to the wellhead. The actual data used by DEQ in determining the source water assessment delineation area are available upon request.

### **Identifying Potential Sources of Contamination**

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources.

The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation area were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use in the area surrounding the Eight Mile Prairie Homeowner's Association drinking water system is agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

### **Contaminant Source Inventory Process**

A two-phased contaminant inventory of the study area was conducted during May and June of 2001. The first phase involved identifying and documenting potential contaminant sources within the Eight Mile Prairie Homeowner's Association source water assessment area through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Penny Cronk and the association.

There is one potential contaminant site located within the delineated source water area (Table 1). The site is a railroad that passes through the well's six-year time of travel zone (Figure 2).

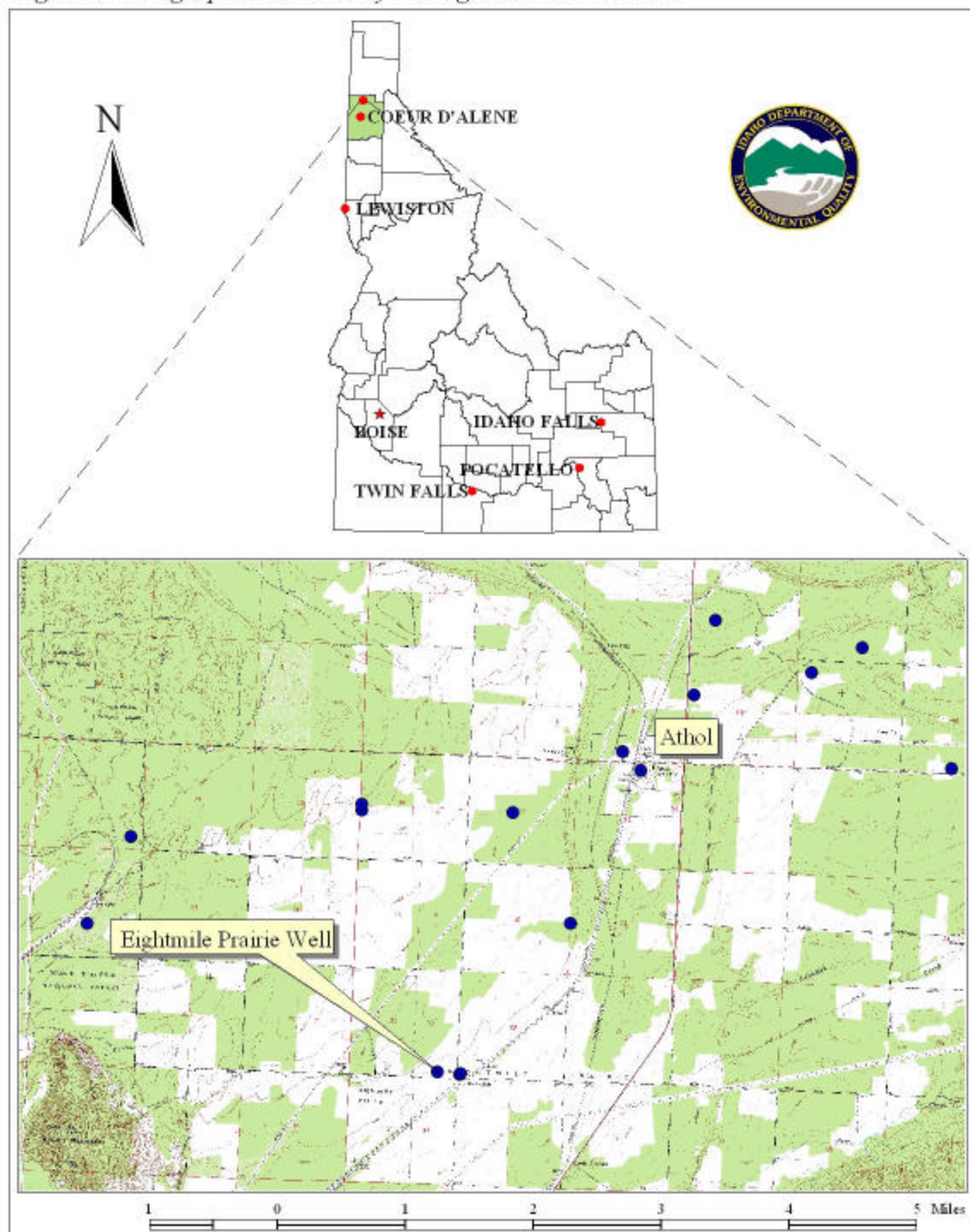
**Table 1. Eight Mile Prairie Homeowner's Association Potential Contaminant Inventory**

SITE #	Source Description	TOT Zone <sup>1</sup> (years)	Source of Information	Potential Contaminants <sup>2</sup>
1	Railroad	6	Database Search	IOC,VOC, SOC

<sup>2</sup> TOT = time of travel (in years) for a potential contaminant to reach the wellhead

<sup>2</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 1. Geographic Location of the Eightmile Prairie Well



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[www.ashdram.com/series/serie1.html](http://www.ashdram.com/series/serie1.html)

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### **Section 3. Susceptibility Analysis**

The susceptibility of the source to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

#### **Hydrologic Sensitivity**

The well's hydrologic sensitivity is high. This reflects porous nature of the soils associated with the Rathdrum Prairie aquifer and the lack of significant confining layers retarding the vertical transport of contaminants. The well casing passes through a mixture of sand and gravel and boulders to the depth of 434'.

#### **Well Construction**

Well construction directly affects the ability of the wells to protect the aquifer from contaminants. Lower scores imply a system that can better protect the water. The Eight Mile Prairie Homeowner's Association drinking water system consists of one well that extracts ground water for domestic use. The well's system construction score is moderate. The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all public water systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. Various aspects of the standards can be assessed from well logs. Table 1 of the *Recommended Standards for Water Works (1997)* states that 8-inch steel casing requires a thickness of 0.322 inches. The Eight Mile Prairie Homeowner's Association uses 0.250-inch thick casing. The casing is perforated from 403' to 433'. The well was sealed to 30' with bentonite. The wellhead and sanitary seal are intact and the well is located outside of the 100-year floodplain.

#### **Potential Contaminant Source and Land Use**

The well rated in the low category for all chemical classes. There is one documented potential contaminant site located within the well's source water assessment area. The site is a railroad that crosses the well's source water assessment area in the 6-year time of travel zone. Land use in the area surrounding the wellhead consists mostly of agriculture.



## Final Susceptibility Ranking

In terms of the total susceptibility score, it can be seen from Table 2 that the well showed low overall susceptibility scores in the inorganic, volatile organic, and microbial categories. The well was automatically assigned a high overall susceptibility score in the synthetic organic chemical category due to the detection of Di(2-ethylhexyl)phthalate in water samples collected from the system.

**Table 2. Summary of Eight Mile Prairie Homeowner's Association Susceptibility Evaluation**

Well	Susceptibility Scores <sup>1</sup>									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
1	H	L	L	L	L	M	M	M	H*	M

<sup>1</sup>H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

<sup>2</sup>H\* - Indicates source automatically scored highly susceptible in this category due to presence of an SOC above the maximum contaminant level in the tested drinking water

## Susceptibility Summary

The Eight Mile Prairie Homeowner's Association drinking water system is currently not threatened by significant potential contaminant sources. The water system should, however, continue to diligently monitor for synthetic organic chemicals because of the episode of contamination that occurred in the spring and summer of 2000.

## Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. The State of Idaho and local health districts have instituted enhanced protection of the ground water in the Rathdrum Prairie Aquifer because of its high use and uniquely pristine water quality. The protections are generally aquifer wide and are not aimed at zones of contribution to a specific well or water system. *The Spokane Valley-Rathdrum Prairie Atlas*, sent to water systems on the prairie when they were invited to perform an enhanced contaminant inventory, describes some of the regional protection measures.

The 186 public water systems in Idaho that draw water from the Rathdrum Prairie Aquifer should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures. These types of measures could be used to protect the capture zones of a specific system or group of wells that could be put at risk from local land use changes.

Eight Mile Prairie Homeowner's Association should focus source water protection activities on implementation of practices aimed at maintaining current water quality. The water system should develop a drinking water protection plan that addresses potential contaminant source management measures, public education and contingency planning. Management measures should be developed to guide the placement of potential contaminant sites within the well's source water assessment area in the future. In this regard, the water system may want to develop partnerships with state and local agencies and industry groups. Cooperation between the water system and these groups is critical to success. The system should attempt to educate local residents regarding the well's location and the location of the well's source water assessment area. Residents should be advised of septic system maintenance procedures and methods for the proper disposal of household hazardous waste. Lastly, Eight Mile Prairie Homeowner's Association should develop a contingency plan that outlines the steps to be taken in the event of a drinking water emergency. The contingency plan should specifically address the possibility of a contaminant spill occurring on the railroad that crosses the well's source water assessment area. In addition, the system can incorporate their existing cross connection control plan into the newly formed drinking water protection plan.

Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resource Conservation Service.

### **Assistance**

Public water supplies and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional IDEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

## References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

# **Attachment A**

## **Eight Mile Prairie Homeowner's Association Susceptibility Analysis Worksheets**

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

1. System Construction		SCORE			
Drill Date	09/26/1990				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2000			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	AGRICULTURE	1	1	1	1
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	YES	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		1	1	1	1
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2 ) 8 Points Maximum		0	0	0	0
Sources of Class II or III leachable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Agricultural	2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		2	2	2	2
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leachable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Agricultural	1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		4	4	4	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leachable contaminants or	NO	0	0	0	
Is there agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		1	1	1	0
Cumulative Potential Contaminant / Land Use Score		8	8	8	3
4. Final Susceptibility Source Score		12	12	12	11
5. Final Well Ranking		Moderate	Moderate	*High	Moderate

\*Source automatically assigned a high susceptibility score in this category due to the detection of an SOC in a water sample taken from the well

# Potential Contaminant Inventory

## List of Acronyms and Definitions

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as **ASuperfund®** is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)**

– Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.